

(12) **UK Patent Application** (19) **GB** (11) **2 193 925** (13) **A**  
(43) Application published 24 Feb 1988

(21) Application No 8719417

(22) Date of filing 17 Aug 1987

(30) Priority data

(31) 8620068  
8620145

(32) 18 Aug 1986  
19 Aug 1986

(33) GB

(51) INT CL<sup>4</sup>

B32B 27/08 27/30 27/32

(52) Domestic classification (Edition J):

B5N 2708 2730 2732

(56) Documents cited

None

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(58) Field of search

B5N

A5R

Selected US specifications from IPC sub-class B32B

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(54) Improvements relating to WC-disposable sheet material

(57) A 30–40 micron water-soluble polyvinyl alcohol film having defined characteristics is laminated to a 12–22 micron water-insoluble PE or PVC film to form a WC-disposable sheet material particularly useful for fabricating into ostomy or incontinence bags.

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## SPECIFICATION

**Improvements relating to WC-disposable sheet material**

5 This invention relates to improved WC-disposable sheet material, a method for its production, and to containers made from the material.

10 The specification of our UK Patent No. 2 083 762B describes composite sheet materials useful for the manufacture of WC-disposable containers such as ostomy bags and incontinence bags. The properties desirable in  
15 such a composite sheet material are WC-disposability, odour-proofness, flexibility, bursting strength,  
20 freedom from noise generated when worn, economy in cost of materials, and economy in cost of manufacture.

We have discovered that the optimum combination of the above desirable properties is  
25 possessed by a WC-disposable sheet material according to the present invention which comprises a cold-water soluble ply having a thickness of from 30 to 40 microns laminated to a water-insoluble ply having a thickness of from  
30 12 to 22 microns, the cold-water soluble ply being formed from a film of polyvinyl alcohol containing by weight from 13 to 20% of a plasticizer, preferably selected from glycerol, ethylene glycol, polyethylene glycol and poly-  
35 etherpolyol, a release agent and a wetting agent, the film having a disintegration time in water at 20°C of from 14 to 22 seconds, and the water-insoluble ply being formed of a film of low density polyethylene or polyvinyl chloride.  
40

According to the present invention there is also provided a method of forming a composite WC-disposable sheet material which method comprises coating with a layer of isocyanate/urethane adhesive a face of a web of  
45 the above-defined film of polyethylene or polyvinyl chloride film or a face of a web of the above-defined polyvinyl alcohol film, the face preferably having previously been subjected to  
50 a surface treatment to improve its receptivity to the adhesive, and bringing the coated face of one of said webs into contact with a face of the other of said webs, which has preferably also been previously treated to improve its  
55 receptivity to the adhesive, under a pressure sufficient to effect intimate contact between the adhesive and said face of the water-soluble film, and controlling the temperature of the combined web for a period sufficient to  
60 effect setting and initial curing of the adhesive.

In a preferred procedure the water-soluble web is subjected to an in-line corona discharge surface treatment to improve the receptivity to adhesive immediately before being  
65 brought into contact with the adhesive and

then led together with the insoluble web through a roller nip in known manner to laminate the webs. The combined webs are then passed through an oven to promote setting of  
70 the adhesive, and rewound into a mill roll which is retained for at least 24 hours to ensure that curing of the adhesive is complete before slitting the web into reels.

The preferred thickness of the polyvinyl alcohol ply is 35 microns and the preferred plasticizer content 19% by weight. To facilitate handling of the water-soluble sheet material the polyvinyl alcohol preferably incorporates wetting agent in an amount of up to  
80 0.25% by weight and release agent in an amount of up to 0.35% by weight. Preferably, again, the thickness of the water-insoluble ply is from 18 to 20 microns.

The adhesive is desirably a freshly mixed  
85 twopart adhesive of the isocyanate/urethane type, and the treatment applied to the surface of each film that is to come into contact with the adhesive is desirably a corona discharge treatment.

Although the composite sheet material of the present invention may be used in sheet form for certain purposes, for example as a bed pan liner, after having been cut to a suitable size, its characteristics are fully utilised  
95 when the edge portions of one or more panels thereof are heat-sealed to fabricate a WC-disposable container. In particular it has been found that when the container is used in a closed condition, as for example when it is an ostomy pouch worn attached to the human  
100 body, a container made from a sheet material according to the present invention has a greater bursting strength, and so affords enhanced security to the user, whilst maintaining  
105 all other desirable properties.

Although the invention may be performed in a variety of ways, some particular examples thereof will now be described by way of example only.

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**EXAMPLE 1**

A web of key-treated polyethylene, 19 microns thick and 1 metre wide supplied by Valentine Mann and Brown was coated with a  
115 freshly mixed adhesive of type Inmont PC 14001, suitably catalysed and at a viscosity of 21 seconds. A web of cold-water soluble polyvinyl alcohol, 35 microns thick supplied by Nippon Gohsei under Grade No. C200 and  
120 comprising 73% resin (88% hydrolysed), 19% plasticiser (polyethylene glycol and polyether polyol), 0.2% alkyl aryl polyether alcohol, 0.3% hydrogenated tallow amine acetate and 7.5% water was exposed to a corona discharge treatment at 3.5 amps current at a  
125 web speed of 55 m/minute, and the treated face led into contact with the adhesivecoated surface of the polyethylene in a roller nip under a load of 0.8 Kilograms/cm width. The  
130 combined web was rewound and retained for

five days before unwinding and slitting into reels.

#### EXAMPLE 2

5 The above Example 1 was repeated but with the adhesive being applied to the corona discharge treated face of the polyvinyl alcohol web instead of to the polyethylene web.

10 It was found that containers made from this complex in the manner described in UK Patent No. 2 083 762 were WC-disposable, odour-proof to faeces, adequately flexible and acceptably silent in use, and were able to withstand a bursting pressure of 200 mm Hg  
15 without rupture.

#### CLAIMS

1. A WC-disposable sheet material which comprises a cold-water soluble ply having a  
20 thickness of from 30 to 40 microns laminated to a water-insoluble ply having a thickness of from 12 to 22 microns, the cold-water soluble ply being formed from a film of polyvinyl alcohol containing by weight from 13 to 20% of a  
25 plasticizer, a release agent and a wetting agent, the film having a disintegration time in water at 20°C of from 14 to 22 seconds, and the water-insoluble ply being formed of a film of low density polyethylene or polyvinyl chloride.  
30

2. A material as claimed in claim 1, in which the thickness of the polyvinyl alcohol film is about 35 microns.

3. A material as claimed in claim 1 or 2, in which the polyvinyl alcohol film has a plasticizer content of about 19% by weight.

4. A material as claimed in claim 1, 2 or 3, in which the plasticizer is selected from glycerol, ethylene glycol, polyethylene glycol and polyetherpolyol.  
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5. A material as claimed in any preceding claim, in which the polyvinyl alcohol incorporates wetting agent in an amount of up to 0.25% by weight.

45 6. A material as claimed in any preceding claim, in which the polyvinyl alcohol incorporates release agent in an amount of up to 0.35% by weight.

7. A material as claimed in any preceding claim, in which the thickness of the water-insoluble film is from 18 to 20 microns.

8. A WC-disposable sheet material substantially as herein described in the foregoing Example 1 or 2.

55 9. A method of forming a composite WC-disposable sheet material, which comprises coating with a layer of isocyanate/urethane adhesive a face of a web of waterinsoluble polyethylene or polyvinyl chloride film having a  
60 thickness of from 12 to 22 microns or a face of a web of watersoluble film which has a thickness of from 12 to 22 microns, is formed of polyvinyl alcohol containing by weight from 13 to 20% plasticizer, a release  
65 agent and a wetting agent, and has a disinteg-

ration time in water at 20°C of from 14 to 22 seconds, bringing the coated face of one of said webs into contact with a face of the other of said webs under a pressure sufficient to effect intimate contact between the adhesive and said face of the other of said webs, and controlling the temperature of the combined web for a period sufficient to effect setting and initial curing of the adhesive.

70 10. A method as claimed in claim 9, wherein the face of said one of said webs to be coated with adhesive is previously subjected to a surface treatment to improve its receptivity thereto.

80 11. A method as claimed in claim 9 or 10, wherein the face of the other of said webs is previously subjected to a surface treatment to improve its receptivity to adhesive.

12. A method as claimed in claim 10 or 11,  
85 wherein the surface treatment is an in-line corona discharge surface treatment.

13. A method as claimed in claim 10 or in Claim 11 or 12 as appendant thereto, wherein the web to be coated with adhesive is subjected to the corona discharge treatment immediately before being coated and led together with the other of said webs through a nip to laminate the webs.

14. A material as claimed in any preceding claim, in which the adhesive is a two part adhesive of the isocyanate/urethane.

15. A method as claimed in any one of claims 9 to 14, wherein the film of polyvinyl alcohol is as defined in one or more of claims  
100 2 to 6.

16. A method as claimed in any one of claims 9 to 15, wherein the water-insoluble film is as defined in claim 7.

17. A method as claimed in which the combined webs are passed through an oven to promote setting of the adhesive, and rewound into a mill roll which is retained for at least 24 hours to ensure that curing of the adhesive is complete before slitting the web into reels.

110 18. A method of forming a WC-disposable sheet material substantially as herein described in Example 1 or 2.

19. A WC-disposable sheet material when formed by a method as claimed in any one of claims 9 to 18.

20. A WC-disposable container formed from sheet material as claimed in any one of claims 1 to 8 or claim 19.

120 21. A container as claimed in claim 20, being an ostomy bag or incontinence bag.

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